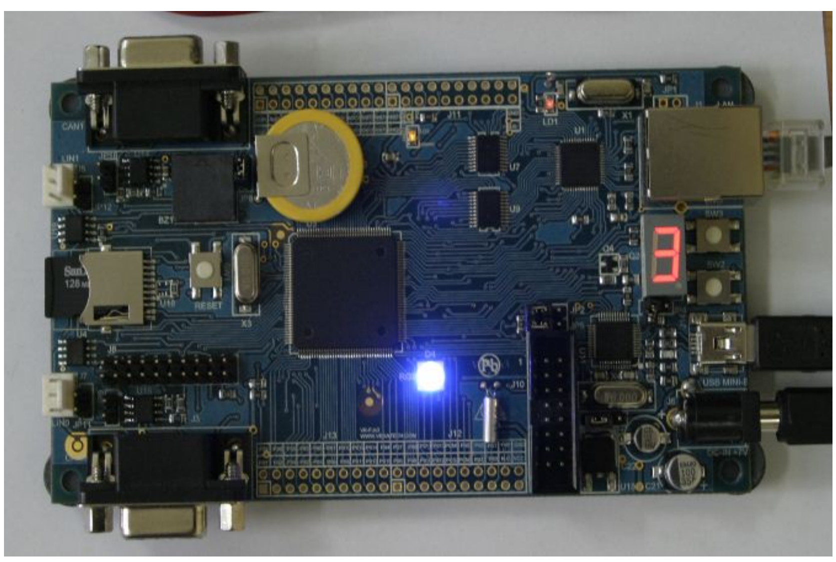
VK-Fx3-uPD70F3380 development board

User manual

Draft Rev. 1, June 1, 2010

Board picture



INTRODUCTION:

VK-Fx3-uPD70F3380 is a starter kit which uses MCU uPD70F3380 from Renesas Electronics. This 32 bit powerful MCU supports various serial interfaces such as CAN, UART/LIN, SPI and etc. Ethernet and USB communication is provided for user application and programing/debug functions. In addition you will find also 20 pins N-WIRE debug interface and 16 pins programing and debugging interface for Minicube2.SD card connector on the board and 384kB SRAM. User push buttons and RGB and 7 Seg leds. All this along with the connected to pin headers unused pins of upd70F3380 allow you to build a diversity of powerful applications to be used in a wide range of embedded tasks.

BOARD FEATURES:

- MCU: V850ES Fx3 - uPD70F3380
- USB device connector (FT2232D)
- 2xCAN connectors (BOSH CF160)
- 2xLIN connectors (ZMD30011)
- RTC with battery backup(STM M41T56M6E)
- Micro SD card connector
- SRAM 384kb (AS7C34098A-12TCN)
- Ethernet 10/100Mb (SMSC LAN9220-ABZJ)
- Buzzer (Murrata PKLCS 1212E4001-R1)
- 16 pins Debug/programming connector (UART0)
- 20 pins N-WIRE connector.
- User RGB and 7 segment LED's.
- 2 push buttons and RESET button.
- External power connector 7V-15V DC
- FR-4, 1.5 mm, blue solder mask, component print.
- Dimensions: 132.5x75.7mm

ELECTROSTATIC WARNING:

The VK-Fx3-uPD70F3380 board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working with this board.

BOARD USE REQUIREMENTS:

Cables: TBD
Hardware:TBD
Software:TBD

PROCESSOR FEATURES:

VK-Fx3-uPD70F3380 board use MCU uPD78F0730 from RENESAS ELECTRONICS with these features:

- Power supply voltage: VDD = 3.6 V to 5.5 V
- Operating ambient temperature: TA = -40 to +105°C
- etc...

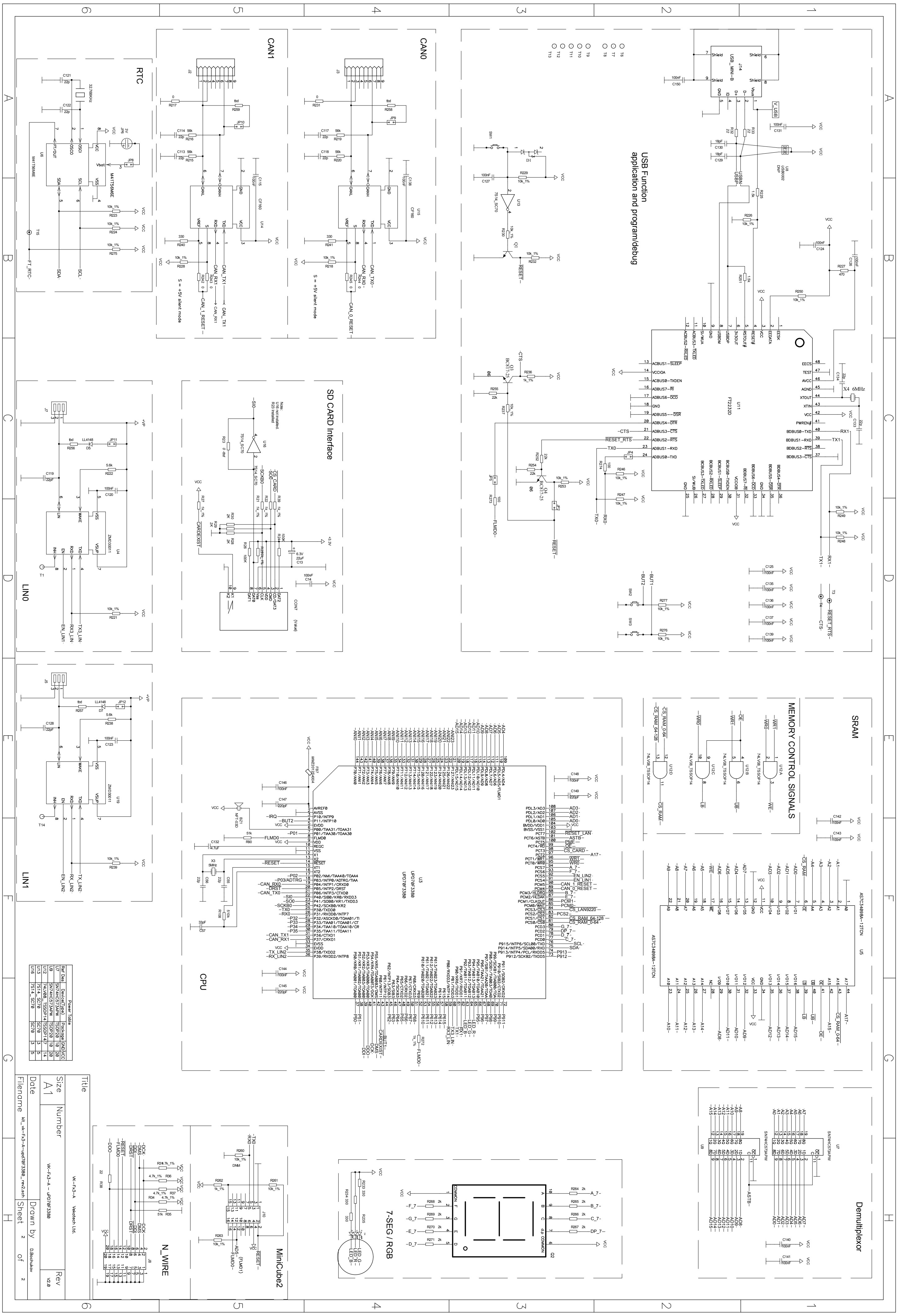
BLOCK DIAGRAM:

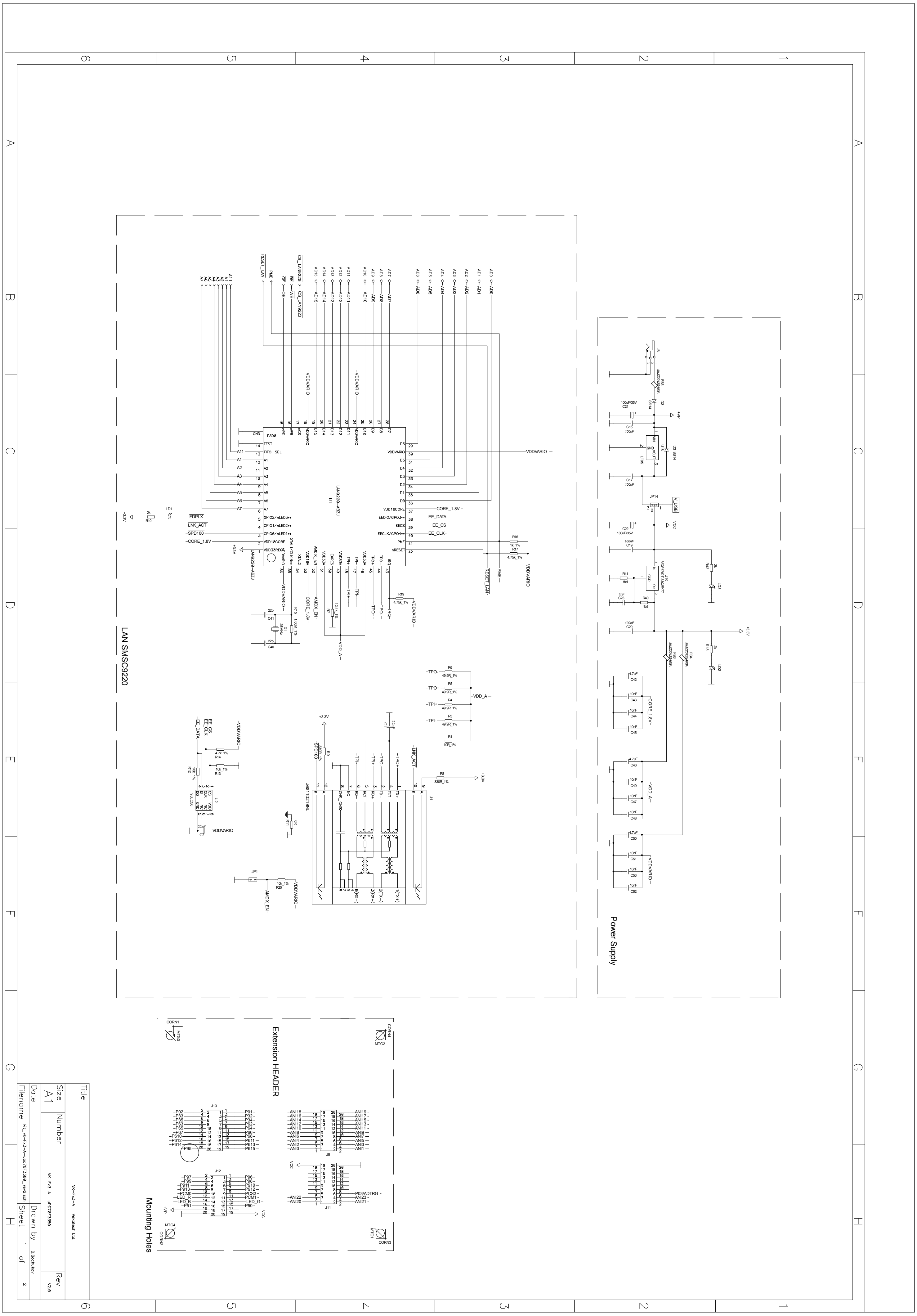
TBD

MEMORY MAP:

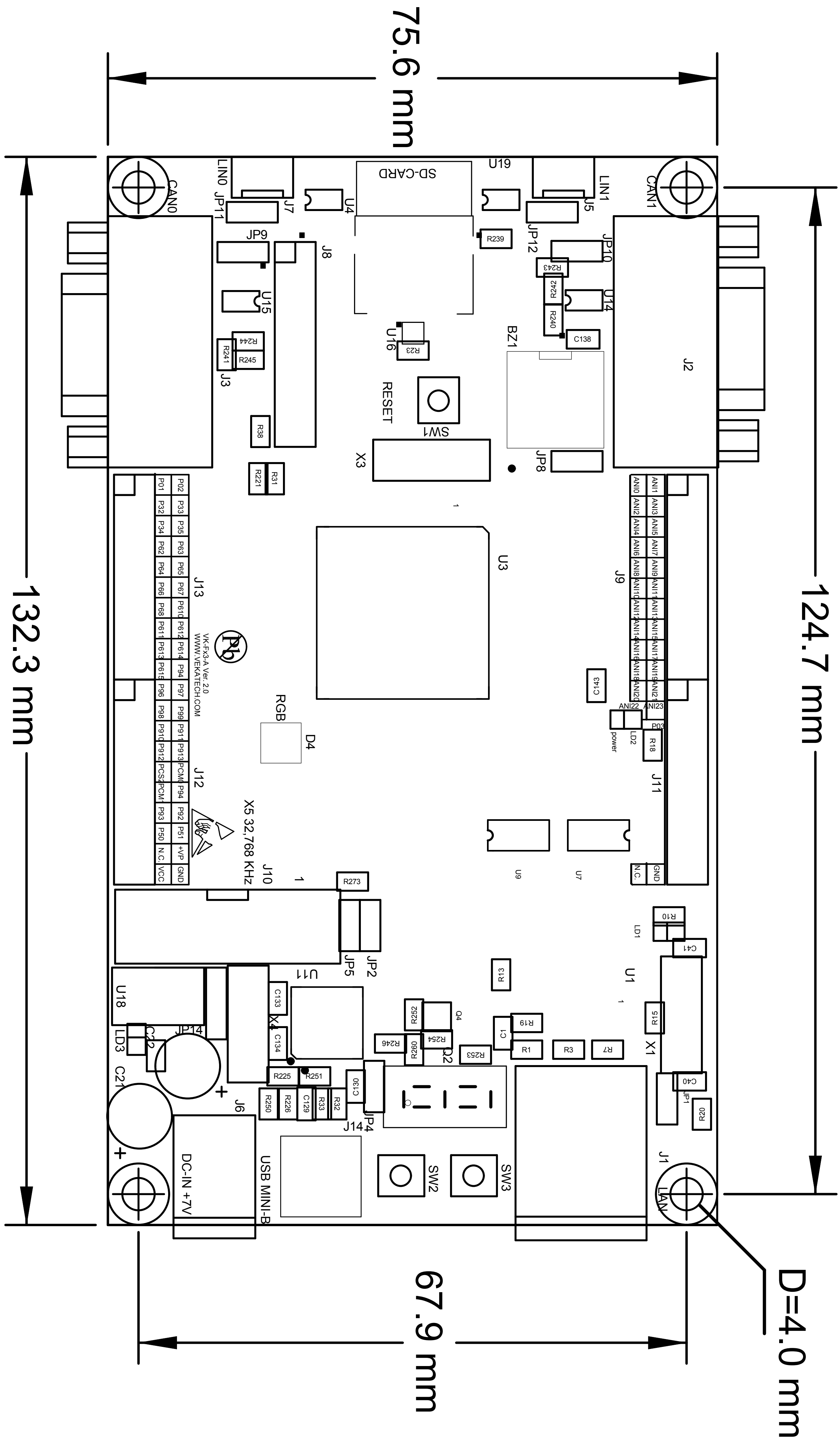
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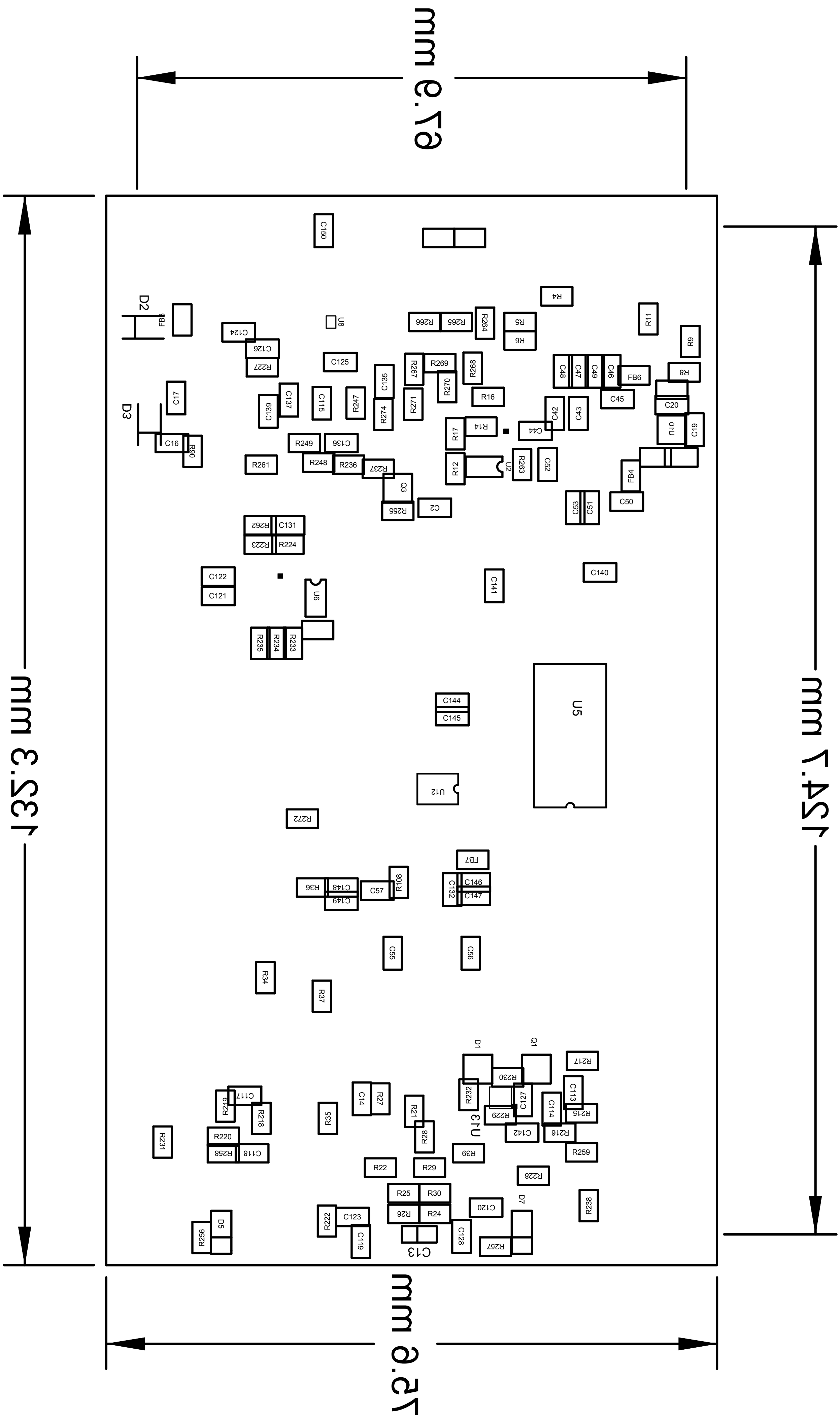
SCHEMATICS


RTC
CAN1
CAN0
USB Function
application and program/debug
SD CARD Interface
LIN0
LIN1
CPU
SRAM
MEMORY CONTROL SIGNALS
Demultiplexor
7-SEG / RGB
MiniCube2
N_WIRE



LAN SMSC9220
Power Supply
Extension HEADER
Mounting Holes
Title
Size
A1
Number
Rev
Date
Drawn by
Filename
Sheet
of


75.6 mm
132.3 mm
124.7 mm
67.9 mm
D=4.0 mm



POWER SUPPLY CIRCUIT:

VK-Fx3-uPD70F3380 is powered by +(7-15) VDC applied at the power jack. VK-Fx3-uPD70F3380 could also be powered by a USB connector . The consumption of VK-Fx3-uPD70F3380 varies depending on the supplied power but at +12 VDC it is about 150 mA.

CLOCK CIRCUIT:

Quartz crystal 5 MHz is connected to uPD70F3380 pin 12(X1) and pin 13(X2).
FTDI FD2232D 5 MHz
Ethernet - SMSC LAN9220ABZJ – 24.0000MHz
RTC- STM M41T56M6E 32.768KHz

RGB LED:

D3 RED LED_R pin 66 (P95).
D3 GREEN LED_G pin 64 (P93).
D3 BLUE LED_B pin 63 (P92).

7 SEG LED:

Signal Name	Pin name	Pin number
A_7	PCS7	94
B_7	PCM3	88
C_7	PCD0	77
D_7	PCD1	78
E_7	PCM2	86
F_7	PCS6	93
G_7	PCD3	80
DP_7	PCD2	79

Piezo buzzer:

Connected to P00 Pin 6.

Push buttons:

SW1	RESET		
SW2	Button1	P61	44
SW3	Button2	P11	4

JUMPER CONFIGURATION

ON
JP1 AMDX_EN
JP2 CONNECT RESET_RTS(FT2232D) to RESET
JP3
JP4 CONNECT RXD(FT2232D) to UART0
JP5 CONNECT !DTR(FT2232D) to FLMD0

JP8 BATERY ON
JP9 CAN0 Termination
JP10 CAN1 Termination
JP12 LIN1 MASTER
JP11 LIN0 MASTER

JP14

1-2 USB

2-3 Power adapter

EXTERNAL CONNECTORS DESCRIPTION:

MiniCube2 Debug/Programming - 16 pins connector:

Pin#	Signal Name	Pin#	Signal Name
1	GND	2	RESET_OUT
3	TX0	4	VDD
5	RX0	6	N.C.
7	N.C.	8	N.C.
9	N.C	10	N.C.
11	N.C.	12	FLMD1
13	N.C	14	FLMD0
15	RESET_IN	16	N.C.

GND – negative power supply
RESET_OUT (OUT) - Pin used to output reset signal to the target device
TXD (OUT) - Pin used to send command/data to the target device
VDD – positive +5V power supply
RXD (IN) - Pin used to receive command/data from the target devic
FLMD0 (OUT) - Pin used to set the target device to debug mode or programming mode
FLMD1 (OUT) - Pin used to set the target device to debug mode or programming mode
RESET_IN (IN) - Pin used to input reset signal from the target system

N-WIRE interface - 20 pins connector :

Pin#	Signal Name	Pin#	Signal Name
1	GND	2	DCK
3	GND	4	DMS
5	GND	6	DDI
7	GND	8	!DRST
9	GND	10	N.C.
11	GND	12	!RESET
13	GND	14	FLMD0
15	GND	16	N.C
17	GND	18	DDO
19	GND	20	VDD

CAN0/CAN1 – 9 pins connectors J2 and J3

Pin#	Signal Name	Description
2	CAN_L	
3	GND	
7	CAN_H	

LIN0/LIN1 3 pin connectors J7 and J5

Pin#	Signal Name	Description
1	+VP	
2	LIN	
3	GND	

Ethernet connector RJ45 type J1

Integrated LEDS and Transformer

PWR:

Pin#	Signal Name	Pin#	Signal Name
1	Positive power	2	Negative power

The power input should be +(7-15VDC)

USB device – USB MINI B connector J14

Pin#	Signal Name	Pin#	Signal Name
1	V_USB	3	USBP
2	USBN	5	GND

Note Pin#4 ID is unconected.
V_USB Output USB device power.
USBN-, USBP+ I/O This signals form the differential input/output depending on the direction of the data transfer.

Micro SD card slot:

Pin#	Signal Name	Pin#	Signal Name
1	DAT2	2	CD/DAT3
3	CMD	4	VDD
5	CLK	6	GND
7	DAT0	8	DAT1
9	NO-a	10	NO-b

DAT0-3 (IN/OUT) - I/O Memory Card Interface Data 0-4.
These are the data lines for the SD connector. They could be both input and output for the MCU depending on the data flow direction.
CMD (OUT) - Output Memory Card Interface Command.
This is a command sent form the processor to the memory card and as such it is output from the processor.
CLK (OUT) - Output Memory Card Interface Clock. This signal is output from the MCU and synchronizes the data transfer between the memory card and the MCU.

UNUSED PIN HEADERS

J9

Pin#	Signal Name	Pin#	Signal Name
1	ANI0	2	ANI1
3	ANI2	4	ANI3
5	ANI4	6	ANI5
7	ANI6	8	ANI7
9	ANI8	10	ANI9
11	ANI10	12	ANI11
13	ANI12	14	ANI13
15	ANI14	16	ANI15
17	ANI16	18	ANI17
19	ANI18	20	ANI19

J11

Pin#	Signal Name	Pin#	Signal Name
1	ANI20	2	ANI21
3	ANI22	4	ANI23
5	n.c	6	P03/ADTRG
7	n.c	8	n.c
9	n.c	10	n.c
11	n.c	12	n.c
13	n.c	14	n.c
15	n.c	16	n.c
17	n.c	18	n.c
19	VDD	20	GND

J13

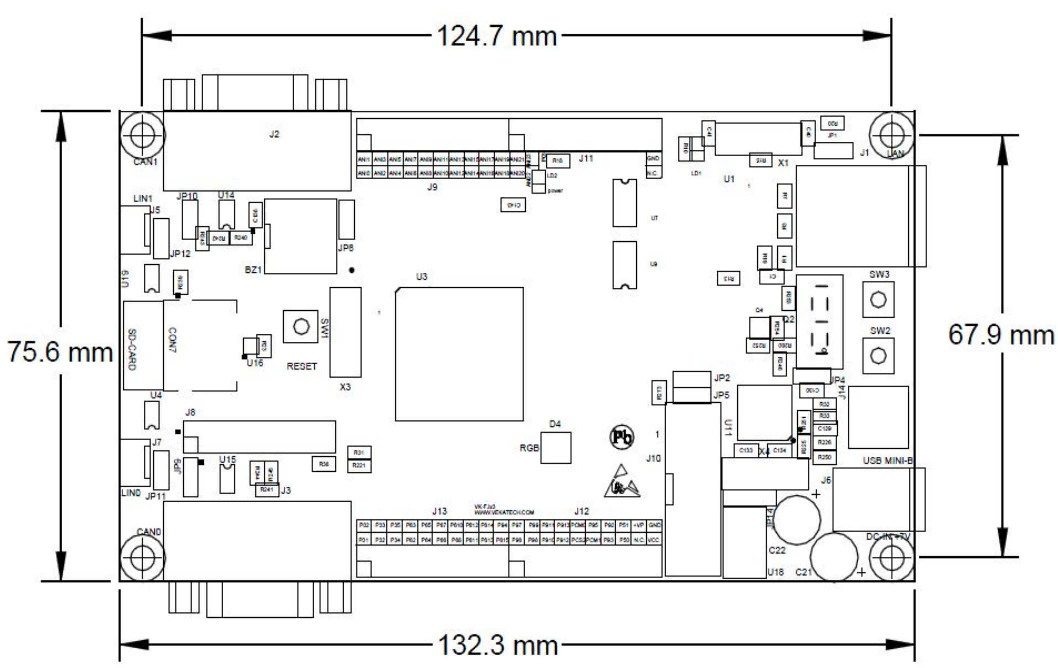
Pin#	Signal Name	Pin#	Signal Name
1	P01	2	P02
3	P32	4	P33
5	P34	6	P35
7	P62	8	P63
9	P64	10	P65
11	P66	12	P67
13	P68	14	P610
15	P611	16	P612

17	P613	18	P614
19	P615	20	P94

J12

Pin#	Signal Name	Pin#	Signal Name
1	P96	2	P97
3	P98	4	P99
5	P910	6	P911
7	P912	8	P913
9	PCS2	10	PCM0
11	PCM1	12	LED_R
13	LED_G	14	LED_B
15	LED_G	16	P51
17	n.c	18	+Vp
19	vcc	20	gnd

MECHANICAL DIMENSIONS:



All measures are in millimeters.

AVAILABLE DEMO SOFTWARE:

1 FREE RTOS BSP.
2 Driver for SMSC 9220.
3 CNET V2.0
4 uT_Kernel – in progress.